about all. Even the exercises in seed germination, as usual, call attention to the non-essentials and miss the large facts. As for the bulk of the work it is the usual round of taking up plant after plant and observing its structural side, not its "life side." There is some interesting non-scientific information about plants, but this seems to be in order to arouse a factitious interest in an otherwise dull task. Even at the beginning of the second year, the direction is to "teach the names of the floral parts — calyx (sepals), corolla (petals), stamens, pistil — and their uses."

We are told that "in the paragraphs marked 'Facts' such necessary knowledge on the subjects therein treated" is given as the teacher is expected to possess; and also "these facts are accurate and based upon the latest and most eminent authority," an expression which makes one shudder when nature study is designed to banish the book and to break the shackles of "authority." In looking over these "facts" it becomes evident that too many of them have been taken from "eminent authority" rather than from observation.

The statement that "the course here presented does not presuppose special training on the part of the teacher" presents a heresy which cannot be too vigorously denounced. It is further stated that "it is not my intention to disparage the value to the teacher of special training in science. Nevertheless, it may be safely stated that the courses generally pursued in college and university do not necessarily equip the student for practical everyday work with little children. They need to be supplemented by actual experience," chief of which, we venture to say, is experience with the subject. Wooden teaching by those who are not trained in a subject is nowhere so conspicuously a failure as in nature study, where the greatest flexibility in the use of material is absolutely necessary.

The book before us is fuller of good intention than any guide to nature study that we have seen; but it will take a good deal of training in the "life side" of plants to enable one to carry out the intention.— J. M. C.

MINOR NOTICES.

MR. JAMES M. MACOUN has published another one of his "Contributions to Canadian Botany."[2] It reports plants new to Canada, new stations and changes in nomenclature.— J. M. C.

MR. EDWIN B. ULINE has published the first part of a monograph of the Dioscoreaceæ[3] as his doctor's thesis at the University of Berlin. The part is devoted to morphology, especially in its relation to the classification of the group, and necessarily involves considerable compilation, accompanied by

[2] Reprint from Canadian Record of Science 267–286. 1897.

[3] Eine Monographie der Dioscoreaceen, Leipzig, Wilhelm Engelmann, Dec. 1897.

discussion of the systematic value of organs. A constancy in the direction of stem twisting, whose importance in classification has been worked out by the author, proves invaluable as a group character, while the importance of characters derived from tuber, rootstock, etc., seem to have been much overestimated heretofore. *Testudinaria* Salisb. has been reduced to a subgenus of Dioscorea, this south African genus having been based upon its tessellated aerial rootstock. The same rootstock was found on the Mexican *Dioscorea macrostachya*.

The following classification is made of the "edible" tubers of the family:

1. Root structure: character uniform.

2. Stem structure: *a*. growth directed downward, subterranean; *b*. growth directed laterally, subterranean; *c*. growth directed upward, above ground.

The striking external differences in *a*, *b*, and *c* are the outcome of variation in the relative position of the most active cambium, and this activity expresses itself quite independently of genetic relationship.

Grisebach and Kunth based their system for the family chiefly upon the character of the staminate flowers, having had but few pistillate plants to examine. The result was that staminate and pistillate plants belonging together were usually described as separate species, and *vice versa*. This arrangement has been very largely abandoned by Dr. Uline, whose exhaustive study of larger and later collections has enabled him to clear away many of the difficulties.

An undescribed kind of hydathode has been found on the leaves of certain African species, and is briefly described.

The chapter "Das System" is but a forecast of the unpublished systematic part, while that on "Geographie" is of unusual value on account of the new perspective, and on account of the exceptionally thorough representation afforded by the material studied.—J. M. C.

A BULLETIN by Dr. H. L. Russell of the Agricultural Experiment Station of the University of Wisconsin, entitled "A bacterial rot of cabbage and allied plants," has recently come from the press.[4] In it is given an account of the origin, symptoms, mode of transmission, and geographical distribution of a bacterial disease which for a number of years has been doing great damage to cabbage and allied plants in various parts of the United States. The morphological, physiological, and culture characters of the organism producing it have been carefully worked out by Mr. H. A. Harding, who has been assisting Dr. Russell.

This is the same disease upon which Dr. E. F. Smith last year published a paper, noticed in this volume, p. 67, and upon which later he issued a Farmer's Bulletin (no. 68) of the U. S. Department of Agriculture. The two

[4] No. 65. February 1898. pp. 39. figs. 15.

investigators agree in almost every particular regarding the disease, so that the main facts may be considered as thoroughly established, having been worked out independently by two competent observers.

It is rather unfortunate, however, that time should be spent in duplicating work, when there is so much to be done. In this particular case, certainly courtesy, not to say economy, demanded that investigation of the disease should not be assumed by the national department, but rather that the work should be left in the hands of the state experiment station, which had a thoroughly trained observer already engaged upon it. In 1895 Dr. Russell presented to the Springfield meeting of the A. A. A. S. a brief preliminary note on "A leaf rot of cabbage," for the purpose of eliciting information in regard to the disease. In this he alludes to certain striking symptoms which serve to identify the disease. His studies were continued in 1896, in the autumn of which year Dr. Smith began his investigation. Scarcely had he begun when he knew Dr. Russell was not only continuing his studies, but had been appealed to by the cabbage growers of Racine, Wis., to find out the cause of their serious losses. The material on which Dr. Smith's first studies were based was sent to him from that locality. While there is no civil law which compels the U. S. Department of Agriculture to keep out of, or withdraw even from work previously undertaken by a state experiment station, there is a law of courtesy which demands it, and Dr. Smith would have done well to heed it.—C. R. B.

NOTES FOR STUDENTS.

ITEMS OF TAXONOMIC INTEREST are as follows: Marshall A. Howe[5] has published a revision of the Anthocerotaceæ of North America, containing ten species of Anthoceros (three of which are new), and two species of Notothylas. Six handsome plates accompany the paper. Anna M. Vail[6] has published a revision of the genus Acerates in the United States, recognizing seven species, one of which is new. John K. Small[7] has published twenty-two new species of Eriogonum, and has constructed a new genus (*Acanthoscyphus*) upon the Californian *Oxytheca Parishii* Parry. H. Eggers[8] has published a new genus of Artocarpeæ from Ecuador, naming it *Poulsenia*.—J. M. C.

THE RECENT DISCOVERY of spermatozoids in Cycas and Zamia has given renewed interest to the study of the Cycadaceæ. Dr. D. H. Scott[9] has discovered in the peduncles of Stangeria and some other cycads the same

[5] Bull. Torr. Bot. Club **25**: 1–24. 1898.
[6] Bull. Torr. Bot. Club **25**: 30–39. 1898.
[7] Bull. Torr. Bot. Club **25**: 40–53. 1898.
[8] Bot. Centralbl. **73**: 49. 1898.
[9] The anatomical characters presented by the peduncle of Cycadaceæ. Annals Bot. **11**: 399–420. 1897.